NEWS

IN BRIEF
6 Areas to watch
What’s coming up in 2021
EDITORIAL p. 5; PODCAST

IN DEPTH
9 Fast-spreading U.K. virus variant raises alarms
Scientists are scrambling to better understand effects of a series of worrisome mutations By K. Kupferschmidt

10 Pfizer’s vaccine raises allergy concerns
Polymer in mRNA’s “packaging” may cause rare anaphylactic reactions By J. de Vrieze

12 A health economist confronts Kenya’s pandemic
Edwine Barasa helps guide the government’s response with data—and quiet persistence By L. Nordling

13 Alaska oil bid alarms scientists
Mapping plan for Arctic refuge ignores risks, critics say By W. Cornwall

14 Slowdown in plate tectonics may have led to ice sheets
Decreased ocean crust production tied to rapid cooling By P. Voosen

15 Congress backs research in 2021 spending bill
Modest increases for science complete 4 years of substantial growth despite Trump By J. Mervis

FEATURING
16 Open access takes flight
As a new mandate takes effect, researchers and institutions grapple with the trade-offs of making scientific publications free for all By J. Brainard

INSIGHTS

LETTERS
22 NextGen Voices
Defining events: 2020 in hindsight

PERSPECTIVES
25 COVID-19 and cancer in Africa
The impacts of COVID-19 present substantial challenges and opportunities in global oncology By B. W. Addai and W. Ngwa

27 The puzzle of the COVID-19 pandemic in Africa
More data are needed to understand the determinants of the COVID-19 pandemic across Africa By J. M. Maeda and J. N. Nkengasong REPORT p. 79

29 RNA-targeted drugs for neuromuscular diseases
Progress with antisense oligonucleotide therapies opens a path for future development By A. Ferlini et al.

31 Why polyamide reverse-osmosis membranes work so well
Inhomogeneities in membrane thickness and density promote water transport By G. M. Geise REPORT p. 72

32 Detecting oxygen changes in the lungs
Lung airway basal stem cells directly sense changes in oxygenation, driving lung regeneration By W. Zacharias RESEARCH ARTICLE p. 52

POLICY FORUM
34 Mapping the global threat of land subsidence
Nineteen percent of the global population may face a high probability of subsidence By G. Herrera-García et al.

BOOKS ET AL.
37 Science’s irrational origins
Disputes in modern science are settled with empiricism alone, an approach early scholars would have questioned By I. Yanai and M. J. Lercher

38 Thermodynamics and the matter of life
A scientist considers life’s genesis through the physics of Exodus By E. A. Mukamel and A. M. Glaser
RESEARCH

IN BRIEF

39 From Science and other journals

REVIEW

42 Circadian rhythms
Clocks, cancer, and chronochemotherapy
A. Sancar and R. N. Van Gelder
REVIEW SUMMARY: FOR FULL TEXT: DOI.ORG/10.1126/SCIENCE.ABB0738

RESEARCH ARTICLES

43 Structural biology
Structural basis of antagonizing the vitamin K catalytic cycle for anticoagulation
S. Liu et al.
RESEARCH ARTICLE SUMMARY: FOR FULL TEXT: DOI.ORG/10.1126/SCIENCE.ABC5667

44 Transcription
Steps toward translocation-independent RNA polymerase inactivation by terminator ATPase γ
N. Said et al.
RESEARCH ARTICLE SUMMARY: FOR FULL TEXT: DOI.ORG/10.1126/SCIENCE.ABD1673

45 Stress responses
QRICH1 dictates the outcome of ER stress through transcriptional control of proteostasis
K. You et al.
RESEARCH ARTICLE SUMMARY: FOR FULL TEXT: DOI.ORG/10.1126/SCIENCE.ABB6896

46 Batteries
A rechargeable zinc-air battery based on zinc peroxide chemistry
W. Sun et al.

52 Stem cells
Airway stem cells sense hypoxia and differentiate into protective solitary neuroendocrine cells
M. Shivaram et al.
PERSPECTIVE p. 32

57 Protein synthesis
Interactions between nascent proteins translated by adjacent ribosomes drive homomer assembly
M. Bertolini et al.

REPORTS

Cell cycle
64 A tripartite mechanism catalyzes Mad2-Cdc20 assembly at unattached kinetochores
P. Lara-Gonzalez et al.

67 CDC20 assists its catalytic incorporation in the mitotic checkpoint complex
V. Piano et al.

72 Membranes
Nanoscale control of internal inhomogeneity enhances water transport in desalination membranes
T. E. Cup et al.
PERSPECTIVE p. 31

76 Materials science
Achieving large uniform tensile elasticity in microfabricated diamond
C. Dang et al.

79 Coronavirus
Seroprevalence of anti–SARS-CoV-2 IgG antibodies in Kenyan blood donors
S. Uyoga et al.
PERSPECTIVE p. 27

83 Cloud physics
Aerosol invigoration of atmospheric convection through increases in humidity
T. H. Abbott and T. W. Cronin

86 Protein folding
Evolution of fold switching in a metamorphic protein
A. F. Dishman et al.

90 Active matter
Low rattling: A predictive principle for self-organization in active collectives
P. Chvykov et al.

DEPARTMENTS

5 Editorial
A little better all the time in 2021
By H. Holden Thorp
NEWS p. 6

98 Working Life
Saying yes to help
By Angela Q. Zhang

ON THE COVER
Multimodal electron microscopy reveals the three-dimensional nanostructure (gold) of reverse-osmosis membranes, as well as the need to control their polymer mass distribution for improved performance. Volume reconstructions with nanometer resolution are used as inputs for water flow simulations that reveal streamlines (gray): here, water flows from top to bottom. Minimizing “dead zones,” thereby achieving a more uniform density throughout the membranes, is key to maximizing water production. See pages 31 and 72. Data Visualization: Greg Foss, Texas Advanced Computing Center, University of Texas, Austin

Science Careers ...........................................96